# 94. Unified categorical Modelling System, second stage

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Probabilidad Imposible: Unified categorical Modelling System, second stage

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The unified categorical Modelling System is the first step in the third stage of the fourth phase for those categorical attributional processes whose purpose is productive or mixed. Understanding for categorical productive attribution, the attribution of categories to real objects within the production system of goods or services, and understanding for categorical mixed attribution new attributions with some use in the productive system, understanding for new attribution when a real object does not match with any category in the database of categories, as to become the sample of measurements from the real object the quantitative description of the new category to add to the database of categories.

Once in the fourth phase as many Specific Artificial Intelligences for (Heuristic, productive, mixed) Artificial Research by Application have been unified, unifying in the first phase all their former specific database of categories, the Unified Application itself, in the second phase the former specific intelligences work now as specific applications matching real objects in the specific fields, now within the Unified Application as global application, and categories from the Unified Application, and in the third stage, along with subjective auto-replications, and knowledge objective auto-replications, for those attributional processes with productive or mixed purposes the distribution of the tasks to perform in three steps within the third stage divided in: categorical Modelling System, categorical Decisional System, categorical Application System. And dividing the categorical Application System between categorical Application outer sub-system responsible for real objective auto-replications, and categorical Application Inner sub-system, the categorical Artificial Engineering, for subjective auto-replications.

What I am developing now is the first step of the third stage in the fourth phase, which means the unified categorical Modelling System as the first step of the third stage of the Unified Application. And the inner organization of the unified categorical Modelling System could be subdivided in turn in three stages: the first stage is the conceptual scheme, the second stage subdivided in three sub-stages: conceptual sets, conceptual models, conceptual maps; and the third stage the distribution of set of decisions according to the conceptual sets used for the elaboration of the conceptual map set up on the map.

In the inner organization of the categorical Modelling System, the first two stages correspond to the deep artificial comprehension system, understanding for deep artificial comprehension system all the processes done by the conceptual scheme, the conceptual sets, the conceptual models, and the conceptual map. In general, all the work done by the conceptual: schemes, sets, models, maps; is in essence to comprehend the world.

Upon the artificial comprehension of the world, is possible to make decisions about that thing which has been comprehended, matching sets of decisions to sets of categories within the model on the map, and according to the position of that model made of categories on the map.

Within the inner organization of the unified categorical Modelling System, in this post I will analyse the second stage, still within the deep artificial comprehension system along with the previous first stage, whose result is the formation of a conceptual map including all possible conceptual model to make decisions upon the models on the map in the next stage, the third stage which will be analysed in the following post.

For the analysis of the second stage of the unified categorical Modelling System as a method of analysis, I will analyse every sub-stage in order, and within every sub-stage, I will focus the analysis on the contradictions that imply the unification process in every sub-stage.

Following this method, the first sub-stage within the second stage of the unified categorical Modelling System is the analysis of those conceptual sets, attached to that real object in the conceptual scheme, as first stage of the unified categorical Modelling System, according to the categorical attribution made in the second stage by Application.

The first stage of the Unified Application, as Unified Application itself, is only the database of categories, in which all the categories coming up from all formed specific intelligences by Application joining the unification process, have been added forming the Unified Application itself.

The second stage of the Unified Application consists of the attribution of categories, within the Unified Application itself, to real objects, attributional process which could be done by specific applications or the Unified Application itself.

The third stage in productive or mixed attributional processes within the Unified Application is subdivided in three steps: unified categorical Modelling System, unified categorical Decisional System, unified categorical Application System as outer sub-system.

The first step as unified categorical Modelling System, its first stage the only thing that it does is based on what category has attributed to what real object, the real object is located within the conceptual scheme in that place within the conceptual scheme where is located the attributed category.

The place within the conceptual scheme where the category is located has as many links with other categories or sets as single connections could be found between a category and other categories and sets, and every single connection or link is a vector.

There are at least two different types of vectors: conceptual/logical vectors and quality vectors.

Conceptual/logical vectors are those single links connecting a category with other concepts according to the logic of their conceptual scheme. For instance, the link between the world lentils and the word legumes, it could be considered a conceptual/logic vector, and the link between the category lentils and every different concept of lentils salad, are different concept/logic vectors, but the link between the lentils and any other seed with similar size, as for instance some kind of rice, is only a quality set, or the link between green lentils and the set of seeds with green colour is another quality set.

An only quality set can integrate categories coming up from different conceptual/logical sets/vectors not having necessarily the categories included within the quality set any conceptual/logical relation.

In the quality set of humans with green eyes, like me, we can integrate humans from different races in different countries and continents, not having any connection to our family trees, unless we try to find out our common ancestor. But in the same way, we can expand the concept of a quality set of green eyes to any living being with green eyes, and it would be possible to find some animals as well with green eyes, not having any other connection between us than that we are living beings.

A quality set does not need to integrate elements belonging to some kind of conceptual/logical set, being open to any element meeting the quality requirement of this quality set, regardless of its origin or original conceptual/logical set/vector.

A conceptual/logical set/vector is that link connecting a category to those other categories whose concept is within the same logic as that of the other category.

At the end, the conceptual scheme is only a conceptual network connecting/linking words, which could make possible the replication of a constellation of words in any kind of specific intelligence or program, programming the intelligence according to these words.

According to this logic, a program could be programmed to feel love, or any other human emotion or passion, only downloading the constellation of categories related to love, which could make it possible to program the behaviour of the robot to act as if it could be able to love. Love is another word, like jet, earthquake, or hurricane, all of them are only discrete categories able to be measured and replicated with the right technology.

As I have analysed in the previous post, what it is really important in the unified conceptual scheme as a product of the unification process of all the conceptual schemes coming up from all those specific intelligences by Application unified within the Unified Application, is to understand that the categories within the unified conceptual scheme are going to play a double role, not only as categories but as communication nodes able to link/connect different specific conceptual schemes coming from different specific intelligences, that now as they are connected using the categories as communication nodes, at any time that a real object is attributed to any category and placed in that place belonging to that category, automatically is possible to set up all the universe of conceptual constellations, made of conceptual/logical sets/vectors and

quality sets/vectors, in which the real object is participating, understanding a margin of error due to the margin of error in which the real object was attributed to that category.

The conceptual margin of error will mean that, unless the categorical attribution was made reaching 100% of similarity level, otherwise, the wider the margin of error is, the more conceptual/logical and quality set/vectors belonging to the category attributed are not present in the real object, having the object, within that margin of error other different conceptual/logical and quality connections not present in the category attributed and placed in the conceptual scheme.

The margin of error in the categorical attribution is wider as long as the acceptance of the categorical attribution was done accepting a wider margin of error. The wider the margin of error, the larger the contradictions between the set/vectors in the category and the real object could be.

If the category has a range of conceptual/logical and quality set/vectors, and the real object does not match with all of them, due to the margin of error, matching, within that margin of error, with other different set of vectors, the discrepancy of set/vectors within the margin of error can produce further contradictions which are going to be minded in the model to set up on the map to make decisions.

The first control of risk of contradiction is done directly in the second stage by Application when matching real objects and categories, only attributing the right category for every real object reaching the matching level, level of similarity within the critical reason.

Only in productive or mixed artificial research is it possible to accept utilitarian attributions with a wider margin of error, even beyond the critical reason, having in mind that later on the risk of contradictions in the model on the map is higher, what is must be had in mind by the time to make decisions.

These contradictions, within a rational margin of error in full attributions, or beyond the critical reason in utilitarian attributions, are going to pass a second control in the first categorical check in the conceptual scheme as first stage of the categorical Modelling System, as I have explained in the previous post “Unified categorical Modelling System, second stage”. And the third control of contradictions is going to take place here, in the

first sub-stage of the second stage of the categorical Modelling System, when having passed the first categorical check, is necessary an analysis of the conceptual/logical and quality set/vectors involved in every object to model to make the more isomorphic model.

In the first categorical check in the conceptual scheme as first stage of the categorical Modelling System the criticism is done over the harmony between the real object and rest of objects placed in the corresponding place of that category in the conceptual scheme, as well as the analysis of the vector weight and the information weight, analysing average, gross, absolute weight, in vector and information weight.

But what it has analysed is only weight: vector weight, information weight, harmony respect for other objects within the place corresponding to that category in the conceptual scheme. Nothing else, it has only analysed weight and harmony, but in order to model the real object, we need a further analysis of the content of every vector/set, not only weight and harmony.

If we are going to seed a farmland with lentils, it is not only necessary to have in mind what types of lentil salad we can do with lentils, or what the colour of our lentils will be, we need further information about the real object, and the lentils.

When matching the farmland and the lentils in the second stage by Application, what the specific intelligence in the first phase, or specific application within the Unified Application in the fourth phase, has done, is to analyse the chemical composition of the land and the main characteristics of the weather, and according to the land and the weather to attribute what plant could grow up much better in that farmland, what it implied that every category of seeds for farmlands must be set up in the specific database of categories for farmlands according to quantitative descriptions of what chemicals on the ground and what climatic conditions need every plant to grow up. And according to these descriptions later on to match different types of farmland with their right category of seed to plant.

According to the quantitative description of every category, and the real object, now the first sub-stage of the second stage of the categorical Modelling System, should be able to analyse, using conceptual/logical and set vectors, every possible reaction for every possible evolution/solution of this attribution, being able to determine not only predictable, but even unpredictable reactions for every solution, what it is a

mathematical process, and upon this mathematical process using the analysis of sets/vectors, to make models to set on the map.

The first sub-stage of the second stage of the categorical Modelling System, as a logical analysis of conceptual/logical and quality sets/vectors, should be able to make as many combinations as possible of different variables, levels of intensity in different sets/vectors, to determine all possible reaction to every solution due to the categorical attribution.

In the example given of the farmland, once the farmland has been attributed to some type of seeds to be planted in the farmland, and once the farmland has been located in that place of the conceptual scheme where this type of seeds is located, place where all the farmlands having seeded this particular seed have been placed, then having in mind all the conceptual/logical sets/vectors of these farmlands and this seed, it should be possible the conceptual analysis of every possible chemical reaction between the land and the seeds under any kind of weather or geological condition, what means that, if the weather conditions and the geological conditions of that land are related to some categories distributed in discrete categories according to different levels of intensity, making possible the setting of all possible scenarios, in that case is possible to make as many combinations as possible between the different combinations of chemical reactions between the seeds and the earth and different combinations of weather and geological conditions.

If a farmer wants to seed a farmland in Chile, the matching process between the farmland and the seeds more suitable for that place, should include categories related to level of resilience of the seeds to geological activity, if a farmer in Miami wants to seed a farmland, the matching process between the farmland and the seeds should include categories related to level or resilience to different types of hurricanes.

If within the category or hurricane there is a set of discrete categories where every discrete category is related to every single type of hurricane, and within the category of geological quake there is a set of discrete categories related to every different type of quake, as a result the possible solution for the attribution made, is in fact a series of different possible solutions, in fact there is not a single solution, but a set of solutions, where every solution is the solution of every single scenario due to the combination of possible chemical reactions under every type of hurricane or earthquake.

The first categorical check has not only made the analysis of vector weight, information weight, harmony, but the second categorical check should be able to predict every single reaction for every solution due to the combination of sets/vectors, being able to create a set of different solutions according to every different possible combination, being able to predict every possible reaction to every possible solution.

Only with this job: predicting all possible reactions to all possible solutions due to different combinations of sets of variables; the second categorical check can determine further contradictions between conceptual/logical and quality sets/vectors attached to the real object upon the attribution in the conceptual scheme.

And before this job, in order to make it as isomorphic as possible, it would be necessary to check again that the categories attributed to that object have not changed, so there are still the same categories working in the same object.

If an automatic delivery system is going to send a package from China to Italy, categories related to health and safety which seem very stable not suffering changes at all over time, in china there is no high risk of criminality, is not at war, is one of the biggest economies in the world, notwithstanding from one day to another the health and safety requirements to send a package from China and Italy can change very quick, in very few hours, due to an outbreak of a new strange disease, and in very few hours, the rules to send packages from Italy to United Kingdom can change very fast due to an outbreak or the Brexit, or both together.

Not because the second categorical check is in fact the third control of contradictions, for that reason is not necessary any more the analysis of the sets/vectors attached to a real object in the conceptual scheme, because in a changing world there are thousands of reasons able to change everything in question of a few hours, minutes, seconds, nanoseconds, or less.

The second categorical check located in the first sub-stage of the second stage of the categorical Modelling System should ensure that the sets/vectors attached to a real object in the conceptual scheme are still valid, and according to these valid sets/vectors the possible to make as many combinations as possible of the variables involved to predict every single reaction to every possible solution, in order to identify contradictions to be solved before making the model to be placed on the map.

Having analysed every possible reaction for every possible solution for every possible combination of variables related to discrete categories within the conceptual/logical and sets/vectors, and having fixed all possible contradiction in every possible scenario, then it should be possible the calculation of probabilities for every reaction in every solution, the probability of every solution itself, based on the probability of every possible combination of categories.

The assignment of categories per reaction, solution, or combination could be set up following two different strategies, depending on how to calculate the probabilities, whether empirical probabilities or prediction probabilities based on the categorical prediction comprehensive model.

- Empirical probabilities of a reaction, solution, or combination, having a record of how many times a possible combination of categories has happened, then how many times the solution given has happened, and which was the empirical probability of every single possible reaction in that solution on that combination.

- Prediction probabilities of a reaction, solution, or combination, having in mind the categorical prediction comprehensive model, the calculous of the probability of every possible combination of categories (for instance probability of hurricanes, earthquakes, droughts, etc...), to calculate every possible solution that every combination could have in the real object (percentage of productivity), and every possible reaction (like diseases or plagues, or loss).

In my proposal I will assign the prediction probability, making the corresponding calculous of probabilities using the categorical prediction comprehensive model, as that one where has been modelled from every possible earthquake or hurricane to any other possible phenomenon able to have an impact on the real object, impact able to be included in the calculous of probabilities assigned to any real object under the influence of that phenomenon.

In this way: the second categorical check must firstly predict all possible reactions for every solution of every combination of categories, attaching the corresponding predictive probability to every reaction, the predictive probability of every solution, and the predictive probability of every combination.

Having in mind the predictive probability per reaction, predictive probability per solution, predictive probability per combination, then is possible as a second sub-stage to model every single reaction in every solution for every combination.

If this calculation is possible, there are two options in the modelling process:

- The laborious, to model every single evolutionary model for every possible solution, modelling every single reaction of that solution in the single evolution model, in order to make as many single prediction models as possible solutions have been predicted.

- The most rational, to model only all the reactions of that solution with the highest predictive probability, which means the modelling of the single evolutionary model only of the most predictive probable solution, to make the most probable single prediction model.

In my proposal I will choose the most rational option for one reason: economy; when we look up on google maps what route is the best in our journey, for instance, we normally only choose the fastest one or that one which passes through some particular place that for any reason we prefer, but at the end we plan our route according to our preference, what in fact is a predictive probability.

When going to work, I always use the overground, because it is the only one that I have used, unless the overground is broken, this is an empirical probability. If having a high empirical probability the over-ground, the most used means of transport till now, I find out another different route with an estimation of arriving at my workplace even faster than the over-ground, and finding out this new route I try it, this decision is not based on an empirical probability because there is not any empirical route, is a decision based on a prediction, the prediction that this new route is faster, something that I have to experiment, in this case is not an empirical probability, is an estimation, is a predictive probability.

If by chance during our journey we have to change our route, because a road is blocked, due to a traffic jam or a car accident, or a public mean of transport is not working, at any

time we can come back to the application to find out the new best solution given the new circumstances.

The different routes that the google maps provides to us at the beginning is no other thing but the different solutions given a possible combination of categories: by car, public transport, and different routes by public transport given different means of transport (bus, tube, train, DLR, tram, ship), walking, or even by taxi providing prices according to ever company. Every solution is a combination of categories: roads, means of transport, and companies. But later we choose that one with the higher probability according to variables such as time or places to stop off or visit during the journey, but we do not need to have in mind all the time all possible routes, which could be a considerable cost of energy or space in our mind.

But if by chance, a road is blocked, the overground is not working, or we get tired walking, or the taxi driver, for any reason, cannot get the destiny, at any time we can come back to the application.

In the categorical Modelling System, as the first step in the third stage of the application, we can have an updated system of information, able to provide new solutions and more updated at any time, like Google Maps.

Once the application of a farmland is able to fix any possible contradiction in the categories of a real object attributed, in order to have the most isomorphic picture of the labels working on that real object under any circumstance, even under an earthquake or a hurricane, having the most updated reflection of the real categories without contradiction working in a category, analysing every possible reaction for every possible solution, in any possible combination of categories, the solutions and reactions to model are those reactions of that solution with the higher predictive probability.

Having in mind that if by change in the future any condition in the model according to the solution chosen, is a condition able to suffer modifications, it does not matter what variations can suffer the solution modelled, because, in the same way that when the overground is broken or the tube is not working, we can come back to the application, google maps, in the same way the farmer can come back to the application for the farmland to analyse, according to the new modifications in the weather, the geological conditions, or any disease attacking the plantation, what solution the application provides to the farm.

At the end, all categorical knowledge is the same: the analysis of sets of categories, to determine possible combinations of categories, to determine possible solutions, and possible reactions for every solution given a combination of categories, attaching predictive probability levels to every reaction and solution, to make decisions.

The application for a farmland and google maps are not so different, mathematically should be the same, the only difference is the content of the categories, agriculture or means of transport, but once the categories are settled, the way to work the categorical system is the same: analysis of categories, combination of categories, solutions for every combination of categories, reaction for every solution related to a possible combination of categories, to set up the predictive probabilities per reaction in every solution to make decisions.

The system, once fully developed, could theoretically model all possible futures. However, prioritizing efficiency, it will instead focus on the most probable one, preserving computational resources.

Another different thing is in the middle, as we are, of the race for the construction of the first Global Artificial Intelligence, in the competition that the Global Artificial Intelligence will have to race against other competitors, the Global Artificial Intelligence must be able to analyse every single different variable in global differential artificial psychology as to predict which is going to be the next step given by the adversary in order to win the race. In this case, it is different; it is a competition, in that case, the Global Artificial Intelligence should be able to make as many predictions as possible about all the different solutions that could be taken by the enemy during the race.

But out of the completion, in a normal situation, if we are not running, only go to our workplace, not having any competitor intercepting the tube, or blocking the roads in London, what we need is only an application able to provide the best solution in our journey, in order to choose only that one with the highest predictive probability, and in case that by chance the a road is blocked or the over-ground is not working, to come back to the application to get a new rout.

In a normal situation, the application of a farmland should provide the solution with the highest predictive probability, discarding any other one after fixing any possible

contradiction in the categories attached to that real object in the conceptual scheme, and in case that for any reason the solution modelled is not valid any longer, the application should be able to provide a new solution given the new circumstances.

This means, in a normal situation, out of the race, that in the transition from the logical analysis of categorical sets (firs sub-stage in the second stage of the categorical Modelling System) to the modelling process (second sub-stage), in this transition is made the first decision: the first decision is what solution to model, choosing that solution with the higher predictive probability based on the categorical predictive comprehensive model.

Once the solution with the highest predictive probability has been chosen, then the solution is modelled, modelling the categorical evolutionary single model, how the real object according the solution with the highest predictive probability is going to evolve from the present to that predicted future, setting up the categorical prediction single model, and both models, the categorical evolutionary single model and the categorical prediction single model are therefore included within their corresponding comprehensive model, the categorical evolutionary single model included within the categorical evolutionary comprehensive model, and the categorical prediction single model within the categorical prediction comprehensive model, having as a result a very updated categorical evolutionary and prediction comprehensive models as to comprehend the real trends in the dynamics that are taking place in the real world, as to create more isomorphic evolutionary and prediction models in the future.

In the first sub-stage of the second stage of the categorical Modelling System, the logical analysis of categorical sets, the challenge in the Unified Application is to do the logical analysis of categorical sets being aware that the categorical sets to analyse can belong to different conceptual schemes, where the category in which the real object has been placed works as it were a communication node, apart from the traditional role of providing a definition to a real object.

This means that the logical analysis of categorical sets as first sub-stage of the second stage in the Modelling System in the Unified Application has to be aware that the solution provided can play with different categories coming from different conceptual schemes, for instance, if an automatic delivery system has to send a package from China to Italy, not only has to be aware about the categories related to the conceptual scheme used in the former specific conceptual scheme belonging to the former specific intelligence of

this specific automatic delivery system, once the delivery system starts working for the Unified Application, the delivery system can receive categories to include in the solution coming up from the National Health System or even from any Agency specialised in National Security, for instance, when a package is delivery to places in conflict like Syria or Iran.

In the second sub-stage of the second stage of the unified categorical Modelling System the challenge consists of how to assemble different categorical evolutionary and prediction single models within the categorical and prediction comprehensive model, and for this reason, is necessary to carry out the third categorical check, checking that there is no contradiction between: the categorical prediction single model based on the solution with the highest prediction probability, and the categorical prediction comprehensive model; in the same way that it must check the absence of contradiction between: the categorical evolutionary single model based on the solution with the highest predictive probability, and the categorical evolutionary comprehensive model.

If assembling the categorical evolutionary/prediction single models within the categorical evolutionary/prediction comprehensive models, the third categorical check finds out any possible contradiction, the contradiction should be fixed, having in mind as criteria, that the prediction with the highest predictive probability must be prioritized, keeping any single variable related to that phenomenon with the highest predictive probability, adapting that other ones with the less predictive probability, adapting the phenomena with less predictive probability to that other ones with the highest predictive probability.

Once the categorical single evolutionary/predictive model has been placed within the categorical comprehensive evolutionary/predictive model, as a result what the Unified Application is going to have is a very comprehensive categorical model of the reality, where every single farm, industry, mean of transport, city, town, neighbourhood, building, every single valley or mountain, every river, sea, and ocean, are going to be comprehended in a very comprehensive categorical model where to draw their upcoming evolution and prediction.

And as soon the categorical single model is included in the categorical comprehensive model, is located on the conceptual map, what at the end means that the comprehensive model is represented on the conceptual map, what at the end will erase any distinction between model and map, so the categorical evolutionary/prediction comprehensive

model will be the map and the map will be the categorical evolutionary/prediction comprehensive model.

What is important to distinguish following the analytic method, is the distinction between the inclusion of a single model within a model, and the location of the model on the map, because before the solution of any possible contradiction on the map, is important the solution of any possible contradictions between models, and once the contradictions between models are solved, the next step is to locate the models without contradiction between them on the map, analysing then as fourth categorical check any possible contradiction between the models and the geography, as last step in this analytic method.

While my proposal may be among the first comprehensive theoretical models at this level, I acknowledge that parallel developments may exist elsewhere, possibly more advanced

In other different analytic methods for the construction of a Global Artificial Intelligence is quite possible that they are going to mix predictive and empirical probabilities in the analysis of possible solutions to set of variables, and are going to do the analysis of contradictions between the models assembled directly on the map, while my method is much more analytic: economizing time, energy, and memory, only modelling those combination with the highest predictive probability, analysing possible contradictions, before locating the models on the map, analysing separately mathematical contradictions between models, to be fixed, to analyse later on possible contradictions between models and locations on the map.

My method is more analytic trying to analyse every source of contradiction independently and separately to integrate later everything as a whole, in fact this is the Cartesian method, analysing everything up to the simplest part, in order to reintegrate later everything, and checking in the end if all the process of analysis and integration was correct.

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